## Space Weather Forecast

Issued on Saturday, 21 October 2023 at 01:11 Local

**This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

---

**Space Weather Forecast Headline: Weak Coronal Mass Ejection arrivals possible, with a chance of G1/Minor Storm intervals on Day 1 (21 Oct), declining thereafter.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Low over the past 24 hours, with only low level Common-class flares. There are currently six sunspot regions on the visible disc, all of which are relatively small and simple, with only a region in the northwest showing some minor growth in recent hours.
No Earth directed Coronal Mass Ejections (CMEs) have been observed during the last 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind shows signs of very minor enhancement, possibly some glancing CME influence starting around 20/1230 . The wind speed has been at slow levels throughout, varying between 330-380 km/s. The Interplanetary Magnetic Field was weak at first, reaching moderate levels from around 20/1230 UTC. The north-south component was weakly variable, but gradually became moderately southward directed from 20/1610 UTC. Geomagnetic activity was Quiet (Kp 1-2).

**Energetic Particles / Solar Radiation:** No solar radiation storms were observed, with energetic particles at background levels.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Low solar activity is likely to continue. There is just a slight chance of Moderate-class flares, more so later in the period if we see new regions rotating onto the disc.

**Solar Wind / Geomagnetic Activity:** The geomagnetic forecast is complex and carries high uncertainty, but overall the forecast is for relatively low activity. There are now two possible Earth directed CMEs. The first is expected to largely miss, but with the potential for a glancing impact in the next 24 hours. The other CME also has a slight chance of glancing impacts shortly afterwards. There is potential for some minor coronal hole fast wind enhancement on Day 1 and again on Day 2 into Day 3 (22-23 Oct).
Geomagnetic activity is likely to be Quiet (Kp 0-2) for much of the time, but with spells of Unsettled to Active (Kp 3-4) activity, and a chance of G1/Minor Storm (Kp 5) intervals should any significant CME interaction occur.

**Energetic Particles / Solar Radiation:** No solar radiation storms are expected.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

# Space Weather Forecast

**Geomagnetic Storms:**

| Geo-Magnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 30 | 10 | 5 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

**Radio Blackouts - X Ray Flares:**

| X Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 M Class | No | 5 | 5 | 10 | 10 |
| Very Active | R3 to R5 X | No | 1 | 1 | 1 | 1 |

**Solar Radiation Storms - (High Energy Protons):**

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}$ $sr^{-1}$ $s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 1 | 1 | 1 | 1 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.